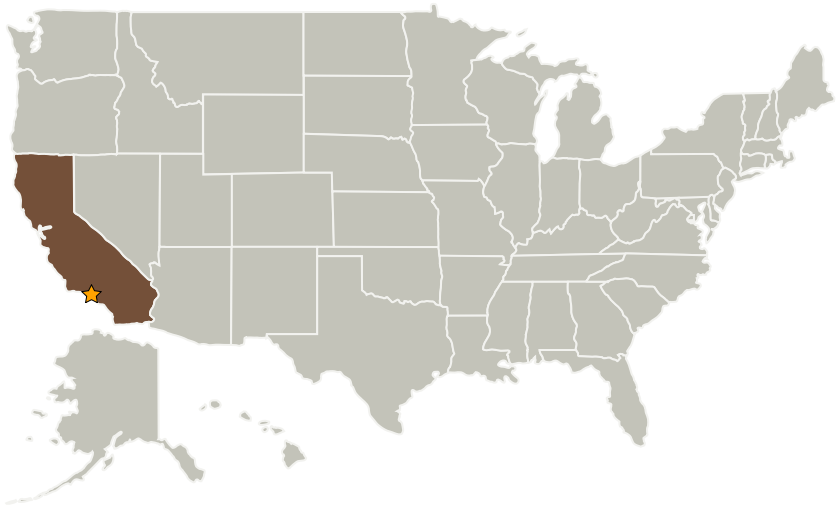
Very Large Solar Rejection Filter for Laser Communication, Phase I

Completed Technology Project (2008 - 2008)

Project Introduction

Surface Optics Corporation (SOC) will develop a band pass filter comprised of a visible dielectric mirror and an induced transmission filter, applied to two sides of a cast polyimide membrane. The mirror/filter combination will block 95% of the incident solar radiation, while allowing a narrow pass-band for YAG laser communication. The combination of a visible dielectric mirror constructed on one side of a membrane and a band-pass filter on the second surface, offers a means of creating a very efficient solar reflector with relatively few coating layers. The exceptionally thin and flat optical substrate will minimize degradation of the laser signal. Meter-class membrane filters are sought by NASA to prevent over-heating of ground-based laser communication receivers operating during daylight hours. In Phase I, induced transmission filter designs based on both silver and germanium films will be evaluated for overall filter performance. Small filters will be constructed and measured for optical performance and agreement with predictions. In Phase II, the best designs will be applied to large membrane substrates approximately 2-m in diameter.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Surface Optics Corporation	Supporting Organization	Industry	San Diego, California

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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations
California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

David Sheikh

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.4 Manufacturing
    - TX12.4.3 Electronics and Optics Manufacturing Process